From Shooting to Sharing: Using video in music education[1]

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http://www.youtube.com/watch?v=CSJwveGQ3WI

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Introduction

Over the past 10 years, the use of video in research and educational practice has grown exponentially[2]. Video allows us to revisit reality, for a second (or 22nd) viewing. It lets us rethink our assumptions about what goes on in classrooms, and view ourselves as a student might. Music teachers regularly use video to show students their rehearsal and to post instructional content. Teachers and students also use sites such as YouTube as a performance venue[3]. In short, "video is the new vernacular."[4]

The power, and importance of video in improving educational practice have led the music education division at the University of Illinois to require each student have a camera to record and share video. This slim paper is designed to give you an overview, along with a few tips and suggestions to allow you easy and responsible shooting of video, and to use it persuasively to further learning.

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[1] This is the first version of the handout. Check in each year or so for updates.

[2] A great survey of the field can be found in this book, which is available as an electronic reference from the UIUC library: Goldman, R., Pea, R., Barron, B., & Derry, S. (Eds.). (2007). *Video Research in the Learning Sciences*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

[3] Cayari, C. (2009). *The YouTube Effect: How YouTube Changed the Way We Consume, Create, and Distribute Music*. Unpublished thesis. University of Illinois at Urbana Champaign.

[4] A phrase attributed to Howard Rheingold.

Tips for shooting video[5]:

Practice: find situations to test out your camera and other equipment. Don't unpack the camera the first time you shoot a lesson you want to video, as you will often figure things out only through practice and experience and a few mistakes.

Use a tripod: virtually all of the video we watch is professionally shot with a tripod or steadicam. Small tripods are available, and inexpensive mini tripods exist that do the job just fine.

Use headphones: even inexpensive cameras often have a headphone jack, giving you the ability to monitor how the sound will sound during playback. When shooting your own teaching, test out the camera and headphones at a separate time in the same space to make sure you have decent audio. If your camera or microphone allows for setting the level, make sure you do not overload (causing distortion).

Consider where the learning is taking place: many educators focus on the teacher when shooting video. Sometimes they shoot students from the back of their heads (to try to make it harder to identify individual students). Unfortunately, the best way to actually understand what is happening in a classroom is to observe the students. It is highly recommended that you shoot from a vantage point in the front or side of a classroom, focusing on students including the teacher where possible. It may also be possible to use two cameras in some situations, combining the footage later.

Enlist a cameraperson: oftentimes you will want someone to shoot the video for you. This is especially the case when other people view the video. All of us are accustomed to and expect the camera to zoom in, pan around, and in general follow the action. This is especially valuable when you have more than one camera, and one is trained on the overall situation.

Don't use "zoom" (when digital): many inexpensive digital cameras today, including the Flip, use a digital zoom. A digital zoom, however, only crops the image and multiplies the pixels, often resulting in a blurry image. If your camera has a digital zoom, don't use it. Rather, move the camera closer for a close up. If in doubt, shoot some footage with zoom, then take a look. A true optical zoom is fine.

Consider sound: video cameras often have very poor quality microphones tuned to capturing speaking voices, and the best visual vantage point is often not great for sound. You may be able to record audio with a separate device (see two camera technique description in this handout for how to merge this data). An additional point is that the camera often automatically adjusts the level of the microphone to maximize the ability to hear what is happening, thereby distorting overall dynamics in a musical performance (e.g. if students play a beautiful pianissimo section, the camera will adjust its sensitivity to make that sound louder in the final video). Experiment, and interpret sound data skeptically with regards to dynamics when using a camera microphone. ***Don't make decisions about ensemble balance without knowing how your sound source distorts what the live ear hears!***

Your responsibilities as a teacher shooting video

Be responsible and conservative

Shooting video in an educational setting is a privilege. Many parents rightly worry that images of their children will be shared with the whole world, and anyone under 18 cannot consent to

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[5] This document does not deal with the complex editing commonly found on YouTube and on TV or video, although many amateurs profitably create works of amazing richness.

participating in a distributed video (only their parent or guardian would be able to do this). In addition, future generations of prospective teachers will rely on your professional conduct in order to maintain access and trust for the use of video to enhance teaching and classrooms.

Any time you shoot video of a school activity or on school property, follow the most restrictive policy you can find, and make sure that teachers and administrators are aware of the fact that you will be collecting video. There may be a blanket consent form in place, or a list of "not to appear on camera students," and it is your responsibility to seek out and understand the policies for your specific situation. Potential sources for policies include, but are not limited to: your music education professor, the classroom teacher, and the local school district.

By default, the music education division wants you to shoot video for internal use only, shared with a group of students and teacher via a password-protected site, and requiring that you delete the video when the project is finished or the semester has ended.

Store video safely and securely

Once you shoot video, you need to be responsible to make sure it doesn't end up where you do not want it. If you do not have permission to share a video, review it and then delete it once you are done reviewing it. If you have permission to post it in a password-protected directory or sharing site, make sure that it is posted with a secure password.

If you need to keep video more than a few days and don't have permission to share it, consider storing the video in a password-protected directory that is encrypted.[6]

If you do share the video via a password, realize that this video can be downloaded by anyone who has the password (or can guess it—don't use a weak password).

Sharing

Upload video to YouTube to share

For music education students at the University of Illinois, we will use YouTube as our video site. This allows for secure storage of private videos, commenting and annotation, decent quality and high reliability. It is also a site that you can continue to use as a teacher in the future.[7] The architecture of this site is constantly evolving, but present limits include: a maximum length of about 10 minutes and a maximum file size of about 2 GB. You'll need to create an account, upload the videos as private, and invite your professor and other colleagues to view and comment.

Compress video (when needed, using HandBrake or other software)

There are a large number of file formats currently in use for shooting and editing video. MiniDV tapes use about 230MB/Min (you'd fill a blank DVD with 20 minutes of raw footage!). Some camera companies avoid paying a license fee and develop their own unique compression algorithms that don't play well with YouTube. I have seen videos that play fine on, only to see the resultant

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[6] There are many ways to achieve this. Search the web for your particular operating system for free options such as encrypted zip files or encrypted disk images.

[7] Another nice site for teachers at present is SchoolTube, which is moderated and not blocked by most districts (http://www.schooltube.com/).

YouTube clip have video but no sound, only sound, or play in slow motion. If this happens, or if your file size exceeds 2 GB, you should consider compressing the file before uploading to YouTube.

Because YouTube always compresses the video you submit before displaying it on the YouTube site, you want to keep the quality of your compression as high as possible. One option is to use the free application HandBrake, which converts to and from a multiplicity of formats (http://handbrake.fr). A recommended test setting is the "Normal" setting on HandBrake (h.264 1500kbps/160kbps AAC audio). This produces a compressed version that looks virtually uncompressed and easily uploads to most video sharing sites.

Store video

There are many instances where you do have permission to store video, and in fact want to keep a copy for a long time. In these instances, simply having a copy on your hard drive is not enough. The accepted standard for a backup would be to have two copies in two different locations. An easy way to do this is to burn a copy of the source files to an archival CD or DVD, keeping one in a different location. Get good quality CDs (see "selected recommended vendors").

Another option is to use some of the 500 MB of free space available using your UIUC NetFiles account. If you don't know what this is, shame on you! Visit https://netfiles.uiuc.edu right away!

Annotation

YouTube currently allows for a multitude of annotation comments within video. This can be a very efficient way to note classroom occurrences, pedagogic ideas, etc. Rather than discuss at length here, your best bet is to visit YouTube to watch video demonstrations, or read their help files:

http://www.youtube.com/t/annotations_about

Tools

Camera: we recommend the Flip camera for its affordability and ease of use, but anything from a cell phone camera to a professional high-definition camera is acceptable.[8]

Tripod: already mentioned, this is essential! I like the mini ones with flexible legs.

Cord to connect camera to computer: If you use a Flip or other camera that connects via USB, consider purchasing an extension cable so that the camera does not stress the computer USB port. A $1 cable could save the life of a $700 laptop motherboard!

Case for your gear: many cameras today capitalize on their small size and don't bother to include a case, or come with a soft pouch. For my Flip, I bought Tupperware sandwich boxes, which protect the cameras and allow me to put them in my backpack, etc. Put some foam or rags in the case until the fit is snug, so things don't rattle around.

[8] You can't stop a thief, but you can help a good Samaritan: put your name or email address on every camera, cable and case you own in case you lose it. I use a Brother labelmaker, but a Sharpie is fine.

Two camera and external microphone technique (with QuickTime Pro)

I have recently experimented with using two Flip video cameras, along with a Zoom H2 audio recorder, and the results have been very promising. Here's the approach I use using QuickTime Pro, which is available on our lab machines[9]:

1. Assemble your recording devices, and press start on all of them at the same time.
2. Shoot your video and audio, positioning all devices optimally.
3. When back at home, use QuickTime Pro to open each document.
4. Select one track you want to merge, then Edit→Select All and copy the data.
5. Select a different track, then Edit→Add to Movie. If you started recording at precisely the same point, the files will be perfectly in sync. If not, you will need to experiment with slightly adjusting the playhead before pasting.
6. Select Window→Show Movie Properties. You should see a list of all the video and sound tracks available. Mute the audio tracks you don't want (generally the original camera audio). You can also displays a video track by selecting that track and then clicking "Visual Settings", then choosing an offset equal to the width (generally, your video will be 640 pixels wide if standard definition, so you enter that in the offset window).

Selected vendors

The school of music does not endorse any vendors, and we have not conducted any extensive review of vendors. The following is a list of companies that the faculty have used with satisfaction. In the digital age, deals emerge on a moment by moment basis, and shopping around is always encouraged.

B&H in New York: a very knowledgeable staff easily reached by phone, with good prices on cameras and accessories and a solid website. http://www.bhphotovideo.com/

Monoprice: literally the cheapest cables I have ever found, with fast shipping and a huge inventory. I recently bought several extension USB cables for just over $.50 each. http://www.monoprice.com/

Polyline corp: a top source for archival quality blank CD and DVD media. Our recommended brand is Taiyo Yuden (for blank CDs or DVDs—but avoid the “value line”). In bulk these currently cost $.37/each for a spindle of 100 (and don’t forget a slimline jewel case for $.35 or so). http://www.polylinecorp.com/

Music Center: Rex Anderson, the head of audio services for UIUC recommends Tom Merrit here for microphones or top quality headphones, and I’ve gotten some great deals. http://www.musiccenterinc.com/

[9] It may also be possible to achieve this using the free VLC player, but I haven't confirmed this.